JENKS (ED. W.)

The Treatment of Puerperal Septicemia by Intra-Uterine Injections

BY

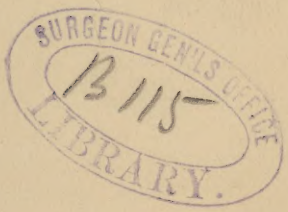
EDWARD W. JENKS, M.D., LL.D.

CHICAGO, ILL.

REPRINT FROM VOLUME IV.

Gynecological Transactions

1880



THE TREATMENT OF PUERPERAL SEPTICEMIA BY INTRA-UTERINE INJECTIONS.

BY EDWARD W. JENKS, M. D.,

Chicago, Ill.

THE subject which I have selected for this paper is by no means a new one, and I present it presuming that each Fellow is familiar with the literature of old and recent dates bearing upon it.

It was very aptly said by our presiding officer at the meeting in Philadelphia, that the "mission" of this Society "should not be narrowed down to the education of its members alone. By educating the masses, by giving the best to the most, it will become a power in the community for good."[1] There is no question but that the influence of this Society is exerted far beyond the limits of its membership; its papers, and the published discussions will continue to serve, as they have in the past, in "educating the masses." With such thoughts in mind I trust that the subject presented for consideration, which is an exceedingly important one, will be fully discussed, that it may be widely known in relation to intra-uterine injections for certain puerperal diseases, what the leading gynecologists and obstetricians of our own country believe and practice.

In the discussion of my subject I give to septicemia a wider range than many authorities allow it. I make no attempt, nor does it seem necessary for my purposes, to reconcile the different opinions entertained by pathologists regarding the etiology, or the special pathology of puerperal

[1] "Annual Address by the President at Philadelphia, 1878," by William Goodell, A. M., M. D.

diseases. The fact is recognized that whether a puerperal disease has an autogenetic or a heterogenetic origin, is of a sporadic or epidemic character, is an essential fever or a phlegmasia, there may be an intra-uterine condition which injections can modify or relieve. Also, prior to constitutional manifestations of disease, there may be an intra-uterine condition characterized by absence of the lochia, an abnormal state of it, or a purulent or fetid discharge, which, if not remedied, may cause blood poisoning, that injections can prevent.

Of the value of intra-vaginal injections succeeding childbirth, there has for a long time been no question. They are made use of for the prophylaxis as well as the therapeutics of certain forms of puerperal disorders. They are quite universally used for every woman recently confined, thus practically asserting that by such means there is washed away what might otherwise act as an autogenetic source of puerperal poisoning. The washing out of the puerperal uterus has in view the same object, namely, the prevention and the cure of septicemia. Since septicemia has come to be looked upon so generally as preëminent among the causes of puerperal diseases, and the uterine cavity as the most frequent place of its beginning, attention seems to have been directed anew to the value of intra-uterine injections as a mode of treatment. Intra-uterine injections cannot be looked upon as a recent or even modern device. They have been used and abandoned, to have their use revived and again abandoned, for reasons which may be made to appear in the progress of this paper. Hippocrates not only advised the use of injections into the cavity of the uterus in certain morbid conditions of that organ, but he fully described the manner of administering them, the kind of instrument one should use, and most minutely indicated the precautions necessary in their use.[1] A recent writer asserts that Albucasis employed them in cases of abortion where portions of the products of conception were retained in the

[1] *Hippocrate Œuvres*, traduites par Littré, viii., p. 431, "Maladies des femmes."

uterus, but I fail to find in Le Clerc's translation,[1] after diligent reading, the warrant for such an assertion. The nearest resemblance is a description of the proper method of fumigating or steaming the uterus. It was a common practice among ancient physicians to pass currents of medicated steam, or steam from herbs, into the vagina, but this author, differing from many ancient writers, directs that one end of the fumigating tube shall be inserted within the neck of the womb.

Galen, Paulus Ægineta, and, later, Sylvius, Roderic a Castro, Paré, Astruc, and many others, are among the advocates of intra-uterine injections for the treatment of diseases of the womb, either puerperal or non-puerperal. Some of the writers who are referred to as supporters of this plan of treatment, seem to be like Mauriceau, and Dionis, who advised their use, while there is no evidence to show that either one ever essayed what they so warmly advocated.

Still later than the authors above mentioned, we find Chomel, Levret, and Baudelocque trying this mode of treatment. Chomel[2] directs that injections shall be made within the womb when there proceeds from it a fetid discharge, or when there is retained within it clots, or fragments of the placenta. In July, 1840, Vidal (de Cassis) read a paper before the Academy of Medicine, of Paris, commendatory of injections within the cavity of the uterus, and announced that he had used them one hundred times without any accident. He insisted that their successful use depended — 1st. Upon the small quantity of fluid used. 2d. The small diameter of the canule of the syringe. 3d. The little force used in making the injections. 4th. The easy escape of the injected fluid from the uterine cavity.

In 1848, Sthroll, of Strasburg, advised the injection of a solution of iodide of iron into the womb for the cure of uterine catarrh. The majority of those who have been mentioned, as the friends of this plan of treatment, pre-

[1] *La Chirurgie d'Albucasis*, traduite par Lucien Le Clerc, Paris, 1861.

[2] *Dictionaire de Médicine*, Art. "Metrite," xxx.

scribed it frequently in other affections of the uterus than puerperal. Following the date last mentioned, non-puerperal diseases of the womb were extensively treated, particularly in France, by intra-uterine injections, various medicinal substances being used in the injections. As this method of treatment became more common, many accidents and cases of sudden death occurred in consequence.

Hervieux[1] makes mention of several deaths taking place in France between the years 1840 and 1865, although during this time, he says, the treatment was very nearly abandoned there. Aran,[2] however, used them extensively in these same years, and states that he has made these injections many hundreds of times without an accident, or so much as a case of partial peritonitis.

Bennet of London, in 1864, held that intra-uterine injections were very dangerous. The same year, Trousseau wrote that "intra-uterine injections cannot be made without danger." Becquerel[3] says that "every wise and prudent physician should proscribe them in the most absolute manner." In 1865, Alf. Avard communicated to the Medical Congress of Bordeaux a memoir upon the subject of intra-uterine injections, in which he described a double current catheter, similar to the one devised later by Dr. Nott, of New York, by means of which there was provided a free escape from the uterus of the injected fluid. By this device it was thought that the danger of this treatment was entirely avoided. Hervieux adopted the instrument of Avard, and in his voluminous work[4] advocates, in puerperal diseases, the mode of treatment under consideration. He is more emphatic on the subject, because, with the catheter of Avard, there is, he thinks, no need of accident. In the last edition of his work he still recommends intra-uterine injections for puerperal septicemia, and continues to use this instrument

[1] Hervieux, *Traité clinique et pratique des maladies puerpérales, suites des couches*, Paris, 1870.

[2] Aran, *Traité des maladies de l'uterus*, 1858–60.

[3] Becquerel, *Traité des maladies de l'uterus*, t. i., p. 432. Paris, 1859.

[4] *Op. cit.*, p. 273.

as a precautionary measure. Hervieux states that he has often noticed a marked decrease in the size of the uterus after each intra-uterine injection, making the remarkable statement that in some instances there was a diminution of from two to two and a half inches in forty-eight, or even in twenty-four hours, in cases of puerperal metritis, where there had been no change for some time preceding the use of injections. He also alludes to the subsidence of the fever and rapid lowering of the pulse from this treatment. Professor Barker, who quotes Hervieux, states that he has never had the good fortune to observe such striking changes in so short a period, but that he has "frequently seen the disinfection of the lochia followed by very marked improvement in the general symptoms, such as the disappearance of the abdominal pains, the return of the appetite, and the gradual fall of the temperature and decrease in the frequency of the pulse." [1]

Nonant,[2] writing, in 1869, of the treatment of simple puerperal metritis, disposes of the treatment by injections within the womb in few words, and in language similar to that of Becquerel, as follows: "*Quant aux injections intra-utérines, nous les regardons comme dangereuses, et nous en proscrivons absolument l'emploi.*" Quite a number of deaths, following, and in consequence of injections within the uterus, have been reported by Simpson, Scanzoni, Winckel, Bessams of Anvers (France), Nélaton, Jobert, and other European physicians, while in this country, Thomas, Noeggerath, Emmet, Warner, and others, have published accounts of cases occurring among patients of their own, or of which they have had knowledge. Professor Thomas, in his admirable work,[3] alludes to some of these reports, and mentions some of the friends and opponents of intra-uterine injections, but what he writes relates chiefly to their use in non-

[1] *The Puerperal Diseases*, by Fordyce Barker, M. D., 3d ed., New York, 1874, p. 322.

[2] Nonant, *Traité pratique des maladies de l'uterus*, p. 212. Paris, 1869.

[3] *A Practical Treatise on the Diseases of Women*, by T. Gaillard Thomas, p. 268. Philadelphia, 1874.

puerperal rather than puerperal diseases. Opinion seems still to be somewhat divided in France. Some of the latest works published in Paris on diseases of women would indicate that the treatment, by injection within the womb, of puerperal or non-puerperal uterine disorders, has many warm friends there, and is fearlessly practiced.

Gallard [1] devotes several pages to the discussion of their use, and expresses the opinion that there is no danger attending them, if one is careful. Leblond [2] is perhaps a little more cautious, but still holds about the same views as Gallard.

A patient of Scanzoni's died in consequence of the injection of carbonic acid gas into the womb as an anesthetic. Fatal results have ensued where injections were used for the purpose of inducing premature labor, or producing abortion, of which reports have been published in home and foreign journals. At a recent meeting of the Obstetrical Society of London, a report was made by Dr. Cory of a case of instant death following the injection of a solution of perchloride of iron into the womb, for the purpose of arresting a slight hemorrhage which had been troubling the patient for a number of days. Further allusion will be made to this case of Cory's elsewhere in this paper.

The history of intra-uterine injections indicates that the use of them, even in the treatment of puerperal diseases as well as non-puerperal affections, has been subject to many changes. At one time they have been praised beyond measure, while at another entirely abandoned. Simpson expresses the opinion that "the consequences of injecting fluid into the cavity of the womb are so often dangerous and deadly, that the practice has now been given up, I believe, by all accoucheurs," [3] and Thomas, writing with special reference to intra-uterine injections for the treatment of chronic corporeal endometritis, sums up the evidence,

[1] *Leçons cliniques sur les maladies des femmes*, par T. Gaillard, Paris, 1873.

[2] *Traité élémentaire de chirurgie gynécologique*, par A. Leblond, Paris, 1878.

[3] *Diseases of Women*, American Edition, p. 110.

pro and con, adding that "the deduction which the evidence elicited forces upon us is self evident, namely, that at the same time that the method of treatment systematically and carefully resorted to, is a valuable resource in endometritis, it is attended by many and great dangers."[1]

Of late years, while there are some, particularly among continental gynecologists, who continue to make use of these injections in chronic uterine disorders, that number is extremely limited. In this country, the late Drs. Nott and Kammerer were warm advocates of intra-uterine injections in the treatment of certain non-puerperal diseases, but their followers were never numerous, and now there seem to be but few friends of this method of uterine therapeutics in the United States. There are certainly none among American gynecologists of any distinction, while many of them have recourse to the same kind of treatment for puerperal septicemia which they have so severely condemned for the treatment of non-puerperal diseases. The majority of obstetrical text books do not allude to the subject, or attach but little importance to it. The invaluable work[2] of Professor Barker commends this mode of treatment, when there are fetid discharges from the uterus, and yet his language is rather guarded, in all probability owing to the fact that four cases of death have come within his observation from this cause. He thinks they can be safely made by using a double canula, and "is absolutely certain of their great usefulness." Of these fatal cases he adds that he "is satisfied that the fatality was not, in either of these cases, a necessary result of what may be termed a washing out of the cavity of the uterus with an antiseptic fluid, but was due entirely to the mode in which these intra-uterine injections were made."

Playfair[3] has in his treatise on midwifery a brief chapter,

[1] *Op. cit.*, p. 269.

[2] *The Puerperal Diseases*, by Fordyce Barker, M. D., LL. D., New York, 1878.

[3] *The Science and Practice of Midwifery*, by W. S. Playfair, M. D., F. R. C. P., American Edition, Philadelphia, 1878.

but one highly commendatory, on intra-uterine injections in the treatment of puerperal septicemia. To the German authors Winckel and Von Grünewald is attributed in a great measure the recent revival of this means of treatment for the prophylaxis and the cure of puerperal septicemia. Winckel[1] writes that Von Grünewald has had some cases attended with such sad results that he has felt obliged to assign narrower limits to their application than formerly." Winckel adds that he, himself, does not make use of intra-uterine injections as a prophylactic measure in healthy lying-in women, but uses them only when "their protective power is no longer in question."

Quite a number of German physicians have recently published essays, showing the results of their treatment, both prophylactic and therapeutic, of puerperal septicemia by means of intra-uterine injections. In the "Revue des sciences médicales" for January, 1879, is a brief review by Porak of several of these papers. The authors there noticed are Münster, Schübein, Richter, Cézmarsky, and Langenbuch. These essays are valuable contributions to the literature of the subject, as their authors have made extensive investigations of the worth of local antiseptic treatment of the puerperal uterus. Further, these papers are among the latest important ones which have been published upon the subject, and cannot but be gratifying to the friends of intra-uterine injections for the prevention and cure of puerperal septicemia, as their testimony makes an excellent showing in favor of this plan of treatment. They are, in consequence, deserving of more than passing notice, so that I shall make quite extended reference to them. Allusion is made in the review to the change of opinion to which this mode of treatment has been subject, and it is stated that for several years past it has been "studied with the most severe scientific rigor." Münster[2]

[1] *The Pathology and Treatment of Childbed*, by Dr. F. Winckel, translated by J. R. Chadwick, M. D., p. 48. Philadelphia, 1876.

[2] *Revue des sciences médicales*, January, 1879, from *Ztschr. für Geburtsh. und Frauenkr.*, Stuttg., Bd. 1, Heft 2.

claims that the objections which have been made to intra-uterine injections are not of such a nature as to cause their abandonment.

The entrance of air into the uterine sinuses, the penetration of the injected fluids through the Fallopian tubes, even into the peritoneum, the detachment of thromboses, and the hemorrhage following the irritation of the uterus by the canule of the syringe, etc., are not such unfavorable conditions that they cannot be obviated. This author expresses the opinion that there need be no accident if one takes the precaution to use but a moderate amount of liquid for injection, and has the syringe free from air. He prefers as the material for injections a solution of salicylic acid (one to two grams for 1,000), of which he uses one, two, or three liters until the liquid runs out clear. By this process he obtains not only a detersive action upon the uterine lining, but contraction is excited, causing the uterus to expel clots and fragments of putrefied secundines, and facilitating the normal involution of the uterus. Thus used he has observed that the salicylic acid is often found in the urine, indicating beyond question that it acts beneficially by being diffused through the system. In addition to the therapeutic uses of these injections, this author advises their employment for prophylaxis, if the expelled contents of the uterus indicate any degree of putrefaction, and immediately following all obstetrical operations, if there is a possibility of the operator, himself, carrying into the uterus, with his hands, the "*ferments septogènes.*" Münster reports having made for prophylactic purposes intra-uterine injections for twenty-seven patients where the labor had been delayed; some of these were complicated cases, and some of them had serious lesions. In every case, whatever had been the height of the temperature at the beginning, there were no further complications, and the fever rapidly diminished. As a therapeutic agent he made use of salicylic acid injections seventeen times, five of them for suppression of the lochia, and twelve for endo- or para-metritis. He claims to have demonstrated in the most accurate manner, by means of

these injections, the following important points: That the injection of the day rendered the evening elevation of temperature much less. That the injection of the evening lowered even more the temperature of the following day. In the cases of lochial suppression a few injections sufficed to dissipate all disquieting symptoms. With patients having more serious troubles, as endo- and para-metritis, other treatment in the outset, in conjunction with the injections, was deemed requisite, as quinia, etc. All of these last mentioned "patients recovered, excepting one, a case of diphtheritic endo-metritis, against which intra-uterine injections, like all other remedies, are powerless."

Schülein[1] publishes a table of upwards of twelve hundred cases of labor, coming under his observation, for the purpose of demonstrating the great benefits to lying-in women to be derived from this mode of treatment. The material used for injections by Schülein was carbolized water. This he used, as is a common practice in our own country, as a vaginal wash in every case of labor, but did not inject it into the uterine cavity for prophylactic purposes in normal labors. If a recently delivered woman had an offensive discharge from the uterus, or an increase of temperature, Schülein at once resorted to intra-uterine injections. The immediate effects of such treatment, as a rule, were relief from the dicharge, and a diminution of temperature, so that he was able, as he claims, to avert in every instance uterine complications. Schülein believes intra-uterine injections for puerperal women to be absolutely harmless, if properly given; that there is nothing superior for the purposes of prophylaxis, that they often lower the temperature in a remarkable manner, and also that they greatly diminish the number of deaths from septicemia.

The most extensive investigations, by one individual, of everything pertaining to this mode of treatment, are those of C. Richter,[2] who *administered intra-uterine injections to*

[1] *Revue des sciences médicales*, January, 1879, from *Ztschr. für Geburtsh. und Frauenkr.*, Bd. 1, Heft 2.

[2] *Eodem loco.*

three thousand lying-in women without a single accident. He made use of other remedies in the treatment of puerperal diseases, so that the success attending his practice, while principally due to intra-uterine injections, cannot be credited exclusively to their use. The chief medicine administered internally under his direction was salicylic acid; while in some instances, for the purpose of controlling inflammatory indications, leeches or ice were applied to the abdomen. Richter states that, while he is convinced that he obtained better results at the "Maternité," in puerperal diseases, from intra-uterine injections, than had heretofore resulted from any other treatment, he deemed it essential in some severe cases to have recourse to additional therapeutic means. This author attaches greater diagnostic importance to the pulse than is usual nowadays, and makes the following observation concerning it: If the pulse remains rapid, even when the temperature falls, the lesion should be considered serious; if it lowers, even when the temperature remains high, one may give a favorable prognosis; if the pulse quickens again, even when the temperature remains normal, a relapse is to be feared. Generally, however, the changes in the pulse and the temperature are parallel.

For a long time it has been quite generally believed that the chief dangers attending the injection of fluids into the cavity of the uterus are: the admission of air into the uterine sinuses, and from thence into the circulation, or the forcing injected liquids either into the sinuses and veins, or through the Fallopian tubes into the peritoneal cavity. From either of these occurrences, more particularly the first named, sudden death may result. As sudden deaths have taken place following intra-uterine injections without the discovery of lesions to explain their occurrence, it is thought by many that such inexplicable occurrences should be attributed to shock. It seems to be a growing belief that shock is one of the common causes of the sudden alarming symptoms and of the sudden deaths which have sometimes rapidly followed injections within the uterine cavity.

The "entrance of air into the vessels of the puerperal uterus" is the subject of an essay by Cézmarsky.[1] This writer has collected reports of all the known cases of entrance of air into the sinuses of the uteri of puerperal women, and published one case coming under his own observation. I have myself, in a previous paper,[2] briefly discussed some of the means by which air is introduced into the circulation *via* the uterus of recently delivered women during obstetric operations, as well as other ways, and cited some authorities on the subject, but did not mention the introduction of air in connection with intra-uterine injections. However the air may be introduced, the symptoms are about the same in each instance, being such as may be considered as due to the more or less complete stoppage of blood in the pulmonary veins. The uterine sinuses after delivery are so adapted as to permit air to enter easily into the circulation.

"If in any manner air enter the uterus, it is easy to understand how the alternate contractions and relaxations of the uterus would open the mouths of the sinuses, and force air into the veins. Doubtless the entrance of air is facilitated by an exhausting hemorrhage, such as would temporarily lower the venous blood pressure."[3] Further, the influence of respiration upon movements of the uterus, the position a patient may assume, or certain mal-positions of the womb, favor the admission of air within its cavity. It is without question owing to some one of these causes that air has been introduced into the uterine veins in connection with the administration of simple vaginal injections. That air has been introduced into the uterine veins, and proved the cause of sudden death, there is an abundance of proof. The reports of such occurrences by Madame Lachapelle, Baudelocque, McClintock, Simpson, Hervieux, Lionnet,

[1] *Revue des sciences médicales*, January, 1879, from *Archiv. für Gynæk.*, Bd. 13, Heft 2.

[2] "The Causes of Sudden Death of Puerperal Women," by Edward W. Jenks, M. D., *Trans. Amer. Med. Asso.*, 1878.

[3] *Op. cit.*, p. 18.

Berry, Schatz, Hegar, Scanzoni, Winckel, and others, are scattered through the literature of puerperal diseases. The autopsies of many of the reported cases have demonstrated the presence of air in the veins and in the right ventricle of the heart. Air has been found in the vena cava and heart (Bessams), in the veins of the brain (Lionnet), in some of the veins of the stomach (Olshausen), and other parts of the body, with no other lesions to explain the cause of death. The passage of injected fluid into the circulation may be fully as disastrous as the admission of air, but it is extremely questionable if the passage of fluid through the Fallopian tubes and into the peritoneal cavity could alone cause sudden death, although it might give rise to a rapidly fatal peritonitis. The case of Bessams was one of uterine hemorrhage, caused by the retention of a fragment of placenta; an intra-uterine injection was administered, and the patient died in three minutes. The patient of Dr. Cory, before referred to, whose uterus and appendages were exhibited at a recent meeting of the Obstetrical Society of London,[1] died instantly, almost before the tube of the Higginsons' syringe could be removed. This patient had been admitted to St. Thomas' Hospital on account of a uterine hemorrhage, from which she had suffered for ten weeks since the expulsion of a vesicular mole. To remedy this condition there was injected into the uterus a solution of perchloride of iron. At the post-mortem examination a small quantity of darkish fluid was found in the recto-vaginal pouch; this contained a large amount of iron. The fluid appeared to have entered the peritoneal cavity through the left Fallopian tube. Dr. Braxton Hicks thought that the astringent action of the injection had caused the os uteri and cervix to contract on the pipe, preventing the exit of a portion of the solution; this being so, the patency of the cervical canal cannot be relied upon alone. Dr. Barnes expressed the opinion, with which all ovariotomists can agree, that the mere contact of iron solution with the peritoneum was not necessarily fatal or even dangerous, as he had

[1] *Med. Times and Gazette*, April 5, 1879.

several times swabbed large surfaces of the peritoneum to restrain hemorrhage from adhesions during ovariotomy, the patients recovering. He thought that in Dr. Cory's case there was evidence of shock. This case, like Bessam's and many others, has been cited as illustrating the great danger accompanying intra-uterine injections after delivery, but the use of injections for the purpose of disinfecting the uterus, or the use of powerful astringent injections which may cause immediate contraction of the os and neck, preventing the egress of the injected fluid, and forcing it, and possibly with it a certain amount of air, into the tubes or sinuses, are not parallel illustrations.

Emmet[1] relates the case of a woman, in good general health, who died instantly, with nothing more than a slight convulsive movement, after a small quantity of Churchill's iodine had been injected into the undilated uterine canal. He adds: "In this case, I have been informed that the post-mortem examination revealed the important fact that no portion of the iodine had passed into the Fallopian tubes, or into the uterine sinuses. We shall have to seek an explanation in some effect on the nerve centres, by which a reaction from sudden shock is prevented."

Emmet says nothing about air being the possible cause of death in this instance, nor is there anything in the account of the post-mortem examination indicating that investigations were made with reference to air having been forced into the circulation. Of course, in the non-puerperal womb the probability of air being introduced into the veins is not as pronounced as it is when the sinuses have been developed by pregnancy. But to my mind, in discussing this subject, the question may very properly be asked, Is it not possible for air to be forced by a syringe into the valveless sinuses and veins of the non-puerperal uterus? Analogous to the symptoms which characterize the entrance of air or fluid into the uterine veins, are the serious ones which sometimes attend hypodermic medication, if, by

[1] *Principles and Practice of Gynecology*, by Thomas Addis Emmet, M. D., Philadelphia, 1879, p. 141.

chance, air or fluid is forced into a small vein. I have, myself, seen two marked illustrations of this kind. In one instance, it seemed as if the result must prove fatal ; in the other, the symptoms, though serious, were not as alarming. The indications in both of these cases were that air entering the veins, rather than shock, was the cause of the serious symptoms. In both, the symptoms were closely allied to those which are described as following the introduction of air or fluid into the uterine veins. In the case related by Emmet, in the absence of proof to the contrary, it seems reasonable to believe that air, forced by the syringe into the circulation, may have been the cause of death.

Fritsch, Schede, and, more recently, Langenbuch,[1] have advised, besides washing out the uterus in puerperal septicemia, that an immovable drainage tube be inserted within it, through which carbolized water can be injected. Richter objects to the drainage tube, for the reason that it is liable to become a new source of infection. Langenbuch believes, on the contrary, that the objections to uterine drainage are exaggerated, but in order to meet the objections he washes out the uterus through the tube. He publishes reports of a number of cases thus treated; in one, the tube was tolerated by the uterus for nineteen days.

This mode of treatment seems objectionable for other reasons than those mentioned by Richter; for instance, to prevent infection, a tube requires to be often removed and cleansed, after this is done, in order to keep up constant drainage, the tube must be reinserted. By the frequent removal and replacing of the tube injury may be done to the uterus ; then the tube is liable to become obstructed, or if it permits the free admission of air within the womb, favors more rapid decomposition and is not without its risks. Upon the whole, after carefully reviewing the matter, I am of the opinion that intra-uterine drainage by immovable tubes seems to possess not a single advantage but what can be claimed for intra-uterine injections, and is decidedly less free from objections.

[1] *Op. cit.*

I have so far in this paper referred principally to the investigations and work of others, and briefly alluded to the history of intra-uterine injections. While recalling the history of this mode of treatment, it has seemed almost impossible to avoid entirely some allusion to its uses in the therapeutics of some of the non-puerperal uterine affections.

I fully agree with Drs. Thomas, Emmet, and others to whom I have alluded, and all they have written concerning the dangers of using injections within the cavity of the undilated non-puerperal uterus. It was with great reluctance that I first attempted their use for the treatment of puerperal septicemia, but being fairly driven to testing the efficacy of this treatment as a *dernier ressort* in some serious cases, I have become convinced that the profession generally should be perfectly familiar with all that is known relating to their efficacy for prophylaxis and therapeutics, the proper manner of using them, and every possible danger attending their use. The satisfactory results which have followed the use of intra-uterine injections in the limited number of patients coming within my own observation, has convinced me that they should be used more than is customary in the treatment of puerperal diseases. I am also convinced that by exercising care and prudence there need be no accidents in consequence of washing out the puerperal uterus with antiseptic fluids. I have, myself, made use of intra-uterine injections for the treatment of puerperal disorders in sixteen cases. All of these occurred in private practice, and the majority were treated during the past year and a half. The remedies which I have used for injections have been solutions of carbolic acid and permanganate of potash, the former having been used alone more frequently. Sometimes they were used alternately, and in a few cases the remedies were combined. In none of these cases was salicylic acid given by means of injection, but it was prescribed as a constitutional remedy in connection with quinia or other medicines, in several instances.

It does not seem necessary that I should relate a full history of the cases which I have treated by intra-uterine injection. But yet I believe some of these have shown such pronounced results in favor of the treatment under consideration as to merit more extended notice than would be given them if they were merely included in a general summary. I have, therefore, selected three cases differing widely in symptoms, of which I give synoptical reports, as illustrative of my own experience with intra-uterine injections for the treatment of puerperal septicemia.

Case I. — I was called in consultation to see Mrs. L., aged 28, multipara, who was then laboring under puerperal mania. She had been delivered fourteen days previously of a healthy child: the labor was a protracted one, but was free from any complications. She seemed to be doing well until the eighth day; then the lochia became scanty and offensive, and she began to show signs of mental aberration. She became in two or three days quite violent, and presented many of the characteristics of puerperal mania, such as filthiness about her person and in her speech, seeming abhorrence of those she most loved, etc.

At the time of my first visit the mania was marked, pulse 130, the temperature 103°; her tongue was covered with a thick, dirty yellow coat, excepting the centre, which was brown and inclined to dryness. The breath possessed the sickening, sweetish odor so frequently accompanying this form of blood poisoning.

There were numberless small abscesses upon various parts of her body — the portion of her skin unaffected by these abscesses presented a dirty, dark appearance, while in health she possessed a clear, smooth skin. Physical examination revealed a uterus, large, but perfectly movable and not tender, with a scanty but extremely offensive discharge issuing from its cavity. There were no indications of peritonitis, cellulitis, or any phlegmasia. The general appearance of the patient, the abscesses, the peculiar fetid breath, without any other accompaniments, were plain indications of blood-poisoning; but it was the offensive uterine discharge, more than any other symptom, which prompted me to make use of intra-uterine injections.

Quinia, salicylic acid, and a generous diet, were prescribed, in addition to the injections. This had been about the plan of

treatment before any injections were used, and it was continued ; but the effect of the injections were so manifest that they cannot but be credited principally with her recovery. The almost immediate effect of the first injection was to lower the temperature ; it also brought away some small fragments of partially decomposed animal substance. These fragments continued to be washed away for several days, and the patient gradually improved. It seems unnecessary to mention all the particulars, or give a daily record of the progress of the patient ; it is sufficient to say that from the day the intra-uterine injections were first used her improvement can be dated ; there was from this time a gradual abatement of all the serious symptoms, her mind was restored to its normal condition, coincident with her physical improvement. This was the beginning of a complete but somewhat slow recovery.

Case II. — A robust German woman was delivered of her fourth child, having had an easy normal labor. The second day after delivery she got out of bed and walked about the room and in a cold hall. She was obliged to return to her bed on account of a severe rigor. Her attending physician, Dr. Hawes, reports that the same day the lochial discharge ceased to flow, and on the following day urination became somewhat difficult and painful, and she began to complain of pain, not, however, severe, in the left iliac region, with an occasional "bearing down pain." There was a constant nausea, the pulse ranged from 110 to 130, and the temperature was from 102° to 104°. On the sixth day after her labor, I saw her with Dr. Hawes, and found her condition about as just described with some additional symptoms. The skin was of a dusky, dirty hue, and constantly covered with perspiration. I made a careful and thorough physical examination, and found the uterus large and rather tender to the touch, almost immovable, with a hard swelling somewhat larger than a hen's egg in the connective tissue to the left of it. There was no indication of a general peritonitis, nor was there any particular tenderness about the abdomen except in the region of the pelvic exudation. I assumed that the cellulitis was due to some intra-uterine condition, or, in other words, the starting point of the irritation producing the cellulitis was within the uterus. This belief, coupled with the fact that the lochial discharge had ceased, prompted me to try the efficacy of intra-uterine injections. The effect of the first one was to lower the temperature temporarily,

and to cause the lochia to reappear. On the second day of the injections there was expelled from the uterus a fragment of placenta. From this time improvement made rapid progress, the temperature and pulse gradually fell, and the cellulitis disappeared by resolution.

Case III. — Mrs. M., American, aged thirty-four, multipara, had a severe attack of pelvic peritonitis in the third month of her pregnancy, and was in a feeble condition during the whole period of gestation. At the time of her confinement the temperature and pulse indicated a febrile condition, the labor pains were very feeble, requiring, on that account alone, delivery by forceps. The child was stillborn, the placenta and membranes were delivered entire without trouble, but there was post partum hemorrhage, as the uterus was slow to contract after the expulsion of its contents. This woman's feeble condition, the shock of labor and loss of blood combined, caused her to be in quite a precarious condition for twenty-four hours, after which she began to improve until the third day, when the temperature and pulse plainly indicated some constitutional disturbance. The lochial flow diminished and became offensive. Vaginal washes were used, but circumstances prevented the use of any within the uterus until the following day, by which time the symptoms had grown more serious. The tongue was dry and brown, like one with typhoid fever, *sordes* had appeared about the lips and teeth, pulse was 120 and above. The temperature was 102½° in the morning and 104° in the evening. The surface of the body was drenched with perspiration. Quinia and alcoholic stimulants were freely administered. The effect of the first intra-uterine injection on the temperature was very apparent, as it dropped one degree within an hour. The material used at first was carbolized water, afterwards the same, to which permanganate of potash was added. The discharge from the uterus was offensive in the extreme ; in addition to the ordinary lochial discharge there was pus, small clots, and decomposed shreds from the utero-placental surface. I used injections each time until the injected fluid came away free from any additional substance, and was the same color as when it left the syringe. The uterus was thus washed out three times a day for three days, and for twelve days more twice daily. The sudden effect produced by the injection upon the temperature was more marked with this patient than I have observed in other cases. This was also noticed by Dr.

H. O. Walker, who saw the patient with me several days, and who also administered the injection a number of times in my absence. The patient's recovery was necessarily very slow, but the portion of her illness directly traceable to septicemia gradually yielded to the intra-uterine treatment. The imperfect contraction of the uterus, following the post partum hemorrhage, caused clots to be retained, and these, decomposing, were probably the source of the blood poison. The injection not only washed out these clots, but favored contraction and normal involution of the womb.

The three cases of which I have given brief reports, serve to illustrate the value of intra-uterine injections, where the morbid phenomena were decidedly different, and yet the primal cause of each was essentially the same. By whatever name the different disorders of the patients can be designated, whether puerperal mania, pelvic cellulitis, puerperal metritis, or lochial retention, there can be no question, to my mind, that all may be properly classified under the general head of puerperal septicemia. On this point, treatment, with its results, served as a means of diagnosis. The other cases coming under my observation may be summarized, as a report of each would cause many repetitions and needlessly consume the time of the Society. All of the puerperal women treated by injections within the cavity of the uterus had either offensive or purulent discharges, or else there was an entire absence of the lochia. In three, besides those reported, fragments of the secundines were expelled in consequence of the injections. In none were injections used prior to the third day succeeding labor. The length of time they were used varied from three to sixteen days, depending upon the uterine discharge and temperature. In several instances there were malarial complications, for which quinia was very freely given; this was, however, given to all of these patients as the remedy, *par excellence*, for the prevention and cure of septicemia.

In every case where intra-uterine injections were used the beneficial results were very apparent, while in not a single instance did an accident or any serious consequence follow. I saw one patient, as counsel, in the interior of Mich-

igan, for whom intra-uterine injections were used with decidedly beneficial effects, as far as could be judged by the attending physician and myself. She was considered as rapidly approaching convalescence but suddenly died, the manner of her death being similar to that produced by intra-uterine injection. No post-mortem examination was made, but her death was attributed to heart trouble, or thrombosis, or some difficulty with the circulation. When death occurred there had been no injection given for some hours preceding, but when I learned of the careless manner of their administration it seemed to my mind possible that there was some connection between the intra-uterine injection and the patient's death.

On one occasion when I gave an intra-uterine injection, the fluid having been too cold, the woman experienced pains and very great discomfort for two or three hours.

The best instrument for washing out the uterus is the so-called "Fountain syringe," as with it there is less liability of forcing air into the womb, and the force of the current can be better regulated.

In three instances of pronounced puerperal septicemia attended by offensive uterine discharges, I have advised the attending physicians to make use of intra-uterine injections, but for various reasons my advice was not followed. Of these three, all proving fatal, post-mortem examinations were made in two, and in the uterus of each was found pieces of placenta considerably decomposed; in one entirely detached, and in the other barely adherent. If the puerperal uterus should, under any circumstances, be washed out, or if there are any symptoms which seem to demand such treatment, these two cases were typical ones. In my own opinion the lives of each of these women might have been saved if recourse had been had to intra-uterine injections prior to the complete saturation of their systems with the poison of decomposition, nor are there any better means to cause uterine contraction and expulsion of the placental fragments. In the third case, of which there was no post-mortem examination, there is a lack of positive evi-

dence, but presumptively injections within the womb would have averted the fatal result, as the patient very slowly succumbed to the poison. She was ill for three weeks, and during that time had a constant offensive flow from the uterus. Two days before death some small fragments coming away with the vaginal wash plainly indicated the necessity which had existed for using intra-uterine injections.

Finally, it may be added, that the history of intra-uterine injections, the recorded opinion of eminent observers, with my own observations and experience, lead to the adoption of the following conclusions : —

1. In its wide-spreading relations to other causes of puerperal diseases, and of death, septicemia stands pre-eminent, for, although puerperal diseases are designated by different names, many lesions of the circulatory, respiratory, and nervous systems are the direct or indirect results of blood poisoning ; therefore it is obviously the plain duty of every obstetrician to prevent the absorption of any decomposing materials from the uterus.

2. The objections, which have been made to intra-uterine injections in the treatment of non-puerperal uterine diseases, are not applicable to their use for the prophylaxis or treatment of puerperal septicemia.

3. The number of deaths attributed to intra-uterine injections have, in the majority of instances, occurred when they were used for other purposes than washing out the puerperal uterus with antiseptic fluid.

4. When a death has taken place on account of washing out the uterine cavity after child-birth with a simple antiseptic wash the fatal result has not been in consequence of the injection itself, but from the improper manner of giving it.

5. By the observance of proper precautions on the part of obstetricians this mode of treatment is rendered harmless. To secure entire immunity from danger certain requisites are important, as follows : (*a*) The mouth and neck of the uterus should be well dilated, and a free outlet insured for

the injected fluid. (*b*) Air must not be admitted with the injection. (*c*) The fluid should be injected slowly and without much force. (*d*) The fluid used for injection ought not to be of a lower temperature than the normal temperature of the body. (*e*) Powerful astringents should under no circumstances be injected within the uterus, as they are liable to produce contraction of the os and cervix, and thus aid in forcing the injected fluid into the tubes or sinuses.

6. The administration of these injections ought never to be intrusted to a nurse or inexperienced assistant, but should invariably be given by the accoucheur himself, with as much carefulness and attention to every detail as he would exercise in the performance of a surgical operation.

7. Intra-uterine injections should be used invariably succeeding child-birth, if there exist any of the following conditions. (*a*) If there is premature cessation of the lochia with any constitutional disturbance. (*b*) If there exists a purulent or fetid uterine discharge. (*c*) Whenever there is any abnormality of the lochia, or offensive uterine discharge attended by elevation of temperature, or increased frequency of pulse. (*d*) When there are good reasons for believing that the uterus contains fragments of placenta, or is imperfectly contracted, and contains clots or any animal substance.

8. Intra-uterine injections should be more generally used in the prophylaxis and treatment of puerperal diseases, than has heretofore been customary, for the following reasons: (*a*) If properly administered to puerperal women they are devoid of danger and capable of accomplishing results for good which cannot be attained by any other means. (*b*) There are no other modes of treatment or remedial agents which act as speedily in lowering the high temperature of puerperal septicemia, or accomplish better results in certain inflammatory conditions of the uterus peculiar to the puerperal state. (*c*) They are peculiarly serviceable in causing the expulsion of clots, or fragments of

placenta, and aid in a marked manner in facilitating the rapid involution of the uterus. (*d*) They have diminished in a remarkable manner the number of deaths, which to all appearance were inevitable from puerperal poisoning — far surpassing in this particular any other known means of treatment.